

Abstract

Compressive strength properties of three different varieties of rice, namely Akitakomachi (Short grain variety), Delta and L201 (Long grain varieties) were determined in their natural state. Rough rice was compressed between two rigid plates using a stress–strain tester and the force–deformation curves recorded. Determinations made included initial yield point, yield point, initial yield stress and strain, Young's modulus and Poisson's ratio. Stress was determined by considering the variation of contact area with compression force whereas Poisson's ratio was computed based on the Boussinesq's theory. Initial yield force and Young's modulus were found to be about 18 N and 543 MPa, respectively for the three varieties of rice. Initial yield point and yield point occurred after almost the same deformation of about 0.16 and 0.60 mm, respectively. However, short grain rice had higher Poisson's ratio and lower yield stress compared to long grain rice. Consideration of variation in contact area during compression gave representative apparent compressive strength properties for rough rice.